

WIND POWER EVOLVED

AW3000

KNOWLEDGE REALLY IS POWER. Our wind turbine technology is grounded in more than 15 years of operational observations made within our own wind farms in varied terrains and climates across the globe. Our turbine design answers the challenges facing project developers and owners today in areas of performance, reliability, safety and cost-of-energy. We know what works and what doesn't and the AW-3000 reflects this experience.

BUILT BY DEVELOPERS FOR DEVELOPERS

- ▶ Based on a scaled design of our successful AW-1500, the AW-3000 provides more energy capture per wind turbine location
- ▶ Our track record of wind turbine performance includes global average availability over 98% and extremely low failure rates of major components

OPTIMIZED PERFORMANCE

- ▶ Steel tower (95.5 meter) introduced in 2010 for sites with certain tip height restrictions
- ▶ Dimensions optimized for key markets, allowing the use of rail and standard trucks for minimized transportation costs
- ▶ Large, 116 meter rotor also available for low wind sites

COMPATIBILITY & CONTROL

- ▶ Zero voltage ride-through beyond current regulatory requirements, in addition to grid integration and reactive power solutions to allow for maximum control for stringent grid codes
- ▶ Control software that allows intelligent automatic monitoring and operation

PERFORMANCE & SAFETY

- ▶ Double bearing support on main shaft to reduce bending loads on the gearbox
- ▶ Hydraulic pitch control for safe and reliable blade pitching in all wind environments
- ▶ Safety features like a two-person lift; hub access from inside the nacelle; and spacious, ergonomic nacelle design allow for operational efficiency

12 KV VERSUS 690 V

- ▶ This configuration, proven in our wind turbines, can remove the step-up transformer from the equation and is ideal for projects that are in close proximity to the substation
- ▶ The result is a significant savings over the life of the project
- ▶ Up to 50% savings in collection system costs
- ▶ Average of 1% greater energy productions due to the avoidance of transformer electrical losses
- ▶ Avoidance of maintenance and potential failures of transformers

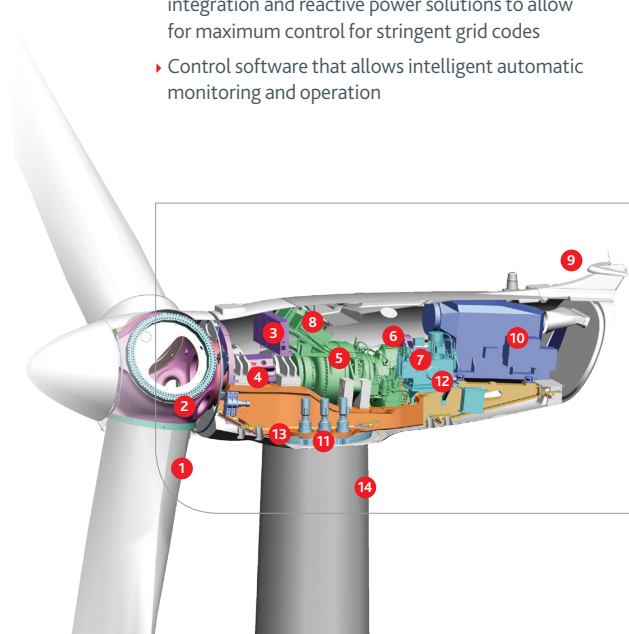
AW3000 MAIN COMPONENTS

- | | |
|------------------------------|--------------------------|
| 1) Rotor Blades | 8) Cooling Radiator |
| 2) Hub | 9) Wind Measuring System |
| 3) Control System Monitoring | 10) Generator |
| 4) Main Shaft | 11) Yaw Drive |
| 5) Gearbox | 12) Hydraulic System |
| 6) Disk Brake | 13) Yaw Bearing |
| 7) Generator Coupling | 14) Tower |



AW 100/3000 | AW 109/3000 | AW 116/3000
AW3000

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TECHNICAL SPECIFICATIONS

MODEL	AW 100/3000	AW 109/3000	AW 116/3000
Rotor diameter	100m	109m	116m
Wind class	IEC Ia	IEC IIa	IEC IIIa
OPERATING DATA			
Cut-in wind speed	4m/s	3.5 m/s	3 m/s
Cut-out wind speed	25 m/s	25 m/s	25 m/s
Nominal power	3,000 kW		
Cold Weather Operational Temperature range (Optional)	-30°C to + 40°C		
Power factor range	+/- 0.93 (1200 kVA)		
Zero voltage ride through	Meets or exceeds global requirements		
ROTOR			
Swept area	7,854 m ²	9,360 m ²	10,568 m ²
Nominal rotation speed	14.3 rpm	13.2 rpm	12.3 rpm
Nominal tip speed	75 m/s	75 m/s	75 m/s
Max sound level	106.4 dBA	106.4 dBA	106.4 dBA
Power regulation	Independent pitch regulated with variable speed		
DRIVE TRAIN			
Gearbox	3 stages: 2 planetary, 1 parallel (helical)		
Bearings	Double spherical roller bearings		
Lubrication	Pressure and splash with oil cooler/oil filter		
PITCH SYSTEM			
Pitch bearings	Double row four point contact		
Actuation	Hydraulic		
Failsafes	Blade independent accumulators on hub		
YAW SYSTEM			
Type	Four point ball bearing, external gear		
Slewing ring	External		
Braking system	Disk+callipers, plus electro mechanical brake per motor drive		
GENERATOR			
Type	6 poles, double feeding		
Frequency	50/60 Hz		
Nominal voltage	12,000 V (able to eliminate step-up transformers depending on wind farm layout)		
Speed range	700 – 1,300 rpm 50 (Hz) / 840 – 1,560 rpm 60 (Hz)		
TOWER			
Steel hub height standard options (m)	95.5	95.5	92
Steel tower number of sections	5	5	5
Concrete hub height standard options (m)	100, 120	100, 120	92, 100, 120
Concrete tower number of sections	5, 6	5, 6	5, 5, 6
NACELLE			
Nacelle weight (tons)	108 t		
Hub weight (tons)	32 t		
Nacelle dimensions	12.5 m (length) 4.09 m (width) 4.19 m (height)		
Nacelle transportability	One and two piece options, rail-capable		
LIFE AND HOIST CAPACITIES			
Service lift capacity	250 kg		
Onboard crane hoist lift capacity	500 kg		



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